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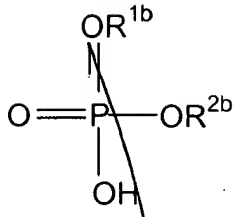
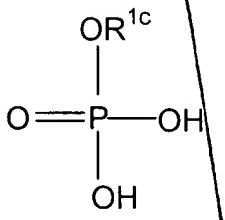


(2)

where R^{1b} and R^{2b} independently represent an aliphatic hydrocarbon group having 1 to 12 carbon atoms or an aromatic hydrocarbon group, and

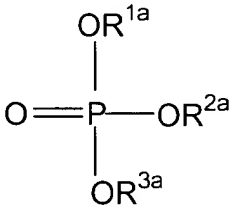
a phosphate represented by general formula (3):



(3)

where R^{1c} represents an aliphatic hydrocarbon group having 1 to 12 carbon atoms or an aromatic hydrocarbon group; and

optionally adding at least one phosphate represented by general formula (1):



(1)

where R^{1a}, R^{2a}, and R^{3a} independently represent an aliphatic hydrocarbon group having 7 to 12 carbon atoms.--

REMARKS

Claims 9-16 are presently pending in the application.

Claims 1-8 have been canceled and the subject matter thereof has been incorporated into new claims 9-16 respectively with the following modifications. Claims 9 and 16 (based on claims 1 and 8) positively recite that at least one phosphate having formula (2) and/or formula (3) is included in the non-aqueous electrolyte secondary battery (whereas a phosphate having formula (1) is optional), which is supported in the specification at least at page 13, lines 10-21. Claim 10 (based on claim 2) more clearly recites that the battery contains a phosphate having formula (1) and/or (2), which have identical substituents. Finally, claim 11 (based on claim 3) positively recites that the mixture contains two or three phosphates, and claim 12, which incorporates the subject matter from claim 4, clearly recites that each of the phosphates in the mixture comprises not less than 30 volume percent of the total volume of the mixture. No new matter has been added by these amendments.

In Paper No. 6, the Examiner has formally rejected claims 2 and 4 under 35 U.S.C. § 112, second paragraph, as being indefinite. Regarding claim 2, the Examiner argues that it is unclear which phosphates were to be present in the electrolyte, the relationship between them, and how this limited claim 1. By this amendment, claim 10, which incorporates the subject matter from claim 2, positively recites that the positive electrode, the non-aqueous electrolyte, and/or the negative electrode contains at least one phosphate having formula (1) or (2), which phosphates have at least two identical substituents. This amendment overcomes the formal rejection, and reconsideration and withdrawal of the § 112 rejection are respectfully requested.

Regarding claim 4, the Examiner argues that it is unclear what the volume of the phosphates was based on, and notes that if there were more than three phosphates, the total volume would be greater than 100%. Claim 11 positively recites that there are two or three phosphates in the mixture, and claim 12 (based on claim 4) recites that each phosphate comprises not less than 30 volume percent based on the total volume of the mixture. Accordingly, reconsideration and withdrawal of the formal rejection are respectfully requested.

The Examiner has also rejected claims 1-8 under 35 U.S.C. § 102(a), (b), or (e) as being anticipated by each of European Patent Application No. 0 917 224 ("EP '224"), Japanese Patent Application Publication No. 10-255839 ("JP '839"), Japanese Patent Application Publication No. 11-233140 ("JP '140"), U.S. Patent No. 6,068,950 of Gan *et al.* ("Gan") and Japanese Patent Application Publication No. 09-223516 ("JP '516"). By this amendment, claims 1-8 have been canceled and the subject matter thereof has been incorporated into claims 9-16. Applicants submit that these rejections are also not relevant to these new claims, and accordingly respectfully traverse these rejections and the arguments in support thereof. Reconsideration and withdrawal of the rejections are respectfully requested.

Rejection Under § 102(b) Based on EP '224

The Examiner argues that EP '224 anticipates the present claims, and points in particular to the abstract, paragraphs 1, 8, 10, 13, 15, 19, 27, 33 and especially paragraph 24. Applicants respectfully traverse this rejection as follows. EP '224 teaches phosphonate (also known as phosphite (see EP '224 paragraphs [0001] and [0008])) additives which are added to a non-aqueous electrolyte in an alkali metal electrochemical cell. As described in paragraph [0024], for example, such phosphonate additives are preferably alkyl phosphonates having the formula $(R^1O)P(=O)(OR^2)(R^3)$, in which R^1, R^2, and R^3 can each be a hydrogen atom or a

saturated or unsaturated organic group containing 1 to 13 carbon atoms. Phosphorous acid ($HP(=O)(OH)_2$) may also be used. In these phosphonate or phosphorous acid additives taught by EP '224, the central phosphorus atom is thus bonded to three oxygen atoms and one hydrogen or carbon atom.

In contrast, the phosphate compounds according to the present invention have the structure $(R^1O)P(=O)(OR^2)(OR^3)$, in which R^1, R^2, and R^3 are aliphatic or aromatic hydrocarbon groups, so that there are four oxygen atoms bonded to the central phosphorus atom. Since EP '224 does not teach or suggest phosphate compounds, it does not anticipate the present claims. Therefore, reconsideration and withdrawal of the § 102(b) rejection are respectfully requested.

Rejection Under § 102(b) Based on JP '839

Regarding JP '839, the Examiner argues that in particular paragraphs 6 and 9 of the machine translation demonstrate how the reference anticipates the present claims. Applicants respectfully traverse this rejection as follows. JP '839 teaches a non-aqueous electrolyte secondary battery comprising a phosphoric ester such as triphenyl phosphate, a halogen-containing phosphoric ester such as trichloroethylphosphate, or a condensation phosphoric ester such as an aromatic condensation phosphoric ester (abstract). Exemplary phosphates include triaryl phosphates, dimethyl methyl phosphate, and halogen-containing trialkyl phosphates (paragraph 6 and Table 1 (translation attached)).

However, JP '839 does not teach or suggest that the battery includes at least one phosphate having general formula (2) or (3), which contain one or two aliphatic substituents having 1 to 12 carbons or aromatic hydrocarbon groups and one or two –OH groups. Since the phosphates taught by JP '839 do not fall within the scope of formula (2) or (3), all of the claimed elements are thus not taught or suggested. Reconsideration and withdrawal of the § 102(b) rejection are respectfully requested.

Rejection Under § 102(a) Based on JP '140

The Examiner argues that JP '140 (in particular the abstract) anticipates the pending claims. Applicants respectfully traverse this rejection as follows. JP '140 teaches a non-aqueous electrolyte secondary battery having a non-aqueous electrolyte obtained by dissolving an electrolyte in a non-aqueous solvent containing a phosphoric ester compound. The phosphoric ester has the structure $(R_1O)P=O(R_2O)(R_3O)$, in which R_1, R_2, and R_3 are each an alkyl group or an aryl group, such as triethyl phosphate, triphenylphosphate, ethyldimethyl

phosphate, etc. In paragraph [0024] (translation attached), exemplary phosphate compounds are taught to include trimethylphosphate, triethylphosphate, tripropylphosphate, tributylphosphate, triphenylphosphate, ethyldimethylphosphate, and methylethylbutylphosphate.

However, JP '140 does not teach phosphate compounds having one or two –OH substituents as in the claimed formulas (2) and (3), since R_1, R_2, and R_3 are limited to alkyl or aryl groups. Since a phosphate having at least one of Formula (2) and Formula (3) is a necessary component of the claimed battery, and since JP '140 does not teach or suggest such phosphate compounds, the claimed invention is not taught or suggested. Reconsideration and withdrawal of the § 102(a) rejection are respectfully requested.

Rejection Under § 102(b) Based on JP '516

The Examiner argues that JP '516 anticipates all of the pending claims, and points in particular to claims 1 and 3 and paragraphs 6, 14, 15 and 53. Applicants respectfully traverse this rejection as follows. JP '516 teaches a non-aqueous electrolyte secondary battery containing a triester phosphate in the non-aqueous electrolyte. The triester phosphate may be a trialkyl phosphate or a triphenyl phosphate (paragraph [0014]). However, the R groups in the trimester phosphate cannot be hydrogen, and thus JP '516 does not teach or suggest that a phosphate having at least one of Formula (2) and Formula (3), which contains at least one –OH substituent on the central phosphorus atom, is a necessary component. Accordingly, JP '516 does not teach or suggest all of the claimed elements, and reconsideration and withdrawal of the § 102(b) rejection are respectfully requested.

Rejection Under § 102(e) Based on Gan

Finally, the Examiner argues that Gan anticipates the present claims, and points in particular to the abstract, col. 2, lines 46-55; col. 6, lines 44-65, and col. 7, lines 21-40. Applicants respectfully traverse this rejection as follows. Gan teaches organic phosphate additives for non-aqueous electrolytes in alkali metal electrochemical cells. The phosphate additives are organic phosphate mono-ester, diester or triester compounds or phosphoric acid. More specifically, the additives are preferably alkyl phosphate compounds having the formula $(R^1O)P(=O)(OR^2)(OR^3)$, in which R^1, R^2, and R^3 are each hydrogen or a saturated or unsaturated organic group containing 1 to 13 carbon atoms. If R^1, R^2, and R^3 are not hydrogen, at least one is $CR^4R^5R^6$ where at least R^4 is an aromatic substitutent or an unsaturated organic or inorganic group. However, in contrast with the presently claimed non-aqueous electrolyte secondary

battery, Gan merely teaches a lithium electrochemical cell, specifically a primary lithium electrochemical cell (col. 2, lines 66-67). Further, Gan does not teach or suggest a chargeable/dischargeable positive electrode or a chargeable/dischargeable negative electrode as claimed, but merely teaches a cathode and an anode. Accordingly, Gan does not anticipate the present claims, and reconsideration and withdrawal of the § 102(e) rejection are respectfully requested.

In view of the preceding Amendments, it is submitted that the pending claims are in compliance with § 112. Based on the above Remarks, Applicants respectfully submit that the pending claims are patentabley distinct from the prior art of record, and in condition for allowance. A Notice of Allowance is respectfully requested.

Respectfully submitted,

HIDEHARU TAKEZAWA, ET AL.

March 13, 2003 By: Sandra M. Katz
(Date)

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Enclosures: Translation of Table 1 of JP '839
Translation of paragraph [0024] of JP '140

Translation of ¶[0024] of JP '140

[0024]

Examples of the phosphate compound include trimethyl phosphate, triethyl phosphate, tripropyl phosphate, tributyl phosphate, triphenyl phosphate, ethyldimethyl phosphate, methylethylbutyl phosphate, etc. Among them, trimethyl phosphate is preferred.

Translation of Table 1 of JP '839

JP 10-255839

【Table 1】

Example 1		Capacity maintenance rate (%)	Capacity recovery rate (%)
Phosphate ester	Triphenyl phosphate	90	98
	Tricresyl phosphate	90	97
	Trixylenyl phosphate	93	97
	Cresyl diphenyl phosphate	92	97
	Xylenyl diphenyl phosphate	90	97
	2-ethylhexyl phosphate	92	98
	Dimethyl methyl phosphate	94	98
	Triallyl phosphate	90	98
Halogen containing type phosphate ester	Tris-chloroethyl phosphate	92	96
	Tris-dichloropropyl phosphate	93	96
	Tris-β-chloropropyl phosphate	93	96
	Tris-(tribromophenyl) phosphate	92	96
	Tris-(tribromoneopentyl) phosphate	90	98
	Diethyl-N,N-bis(2-hydroxyethyl) aminomethyl phosphate	94	98
Condensed phosphate ester	Aromatic condensed phosphate ester	94	98
	Halogen containing type condensed phosphate ester	90	98
Comparative example 1		56	45